Three new deepwater species of Eulimidae (Caenogastropoda) from Brazil

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KEY WORDS. Eulimidae, *Annulobalcis procera* n.sp., *Batheulima lutescens* n. sp., *Batheulima epixantha* n.sp., Brazil, deepwater.

ABSTRACT. Three new deepwater species are described, belonging to the family Eulimidae, based on shells collected in the Marion-Dufresne expedition and Revizee in southeast coast of Brazil. *Annulobalcis procera* sp. n. has the shell longer and slenderer than the remainder congeners and is the second described species of the genus for the South Atlantic. The other 2 species belong to genus *Batheulima*, both have characteristic yellow band in each whorl and are the first record of the genus to the south Atlantic. *B. lutescens* sp. n. is larger, and has a longer aperture and thinner inner lip than *B. epixantha* sp. n.

INTRODUCTION

The MD-55 expedition performed by the R. V. *Marion-Dufresne* in 1987, dredged in the southeast coast of Brazil, and collected several deep-water molluscs, most of them still undescribed. In the present paper, 2 new species of Eulimidae (Caenogastropoda) are described based on shells collected in depths of more than 600 m. The third species was collected by two Brazilian projects, which also have collected several undescribed species in the southeastern coast, as following. The **Revizee** project, "Programa de Avaliação do Potencial Sustentável de Recursos Vivos na Zona Econômica Exclusiva"; and the **PADCT** project, "Importância e Caracterização da Quebra de Plataforma Continental para Recursos Vivos e Não Vivos".

The Eulimidae are parasitic on echinoderms. Warén (1983) reviewed its genera, and this systematic arrangement is adopted herein.

The genus *Annulobalcis* Habe, 1965, encompasses 5 species: *A. shimazui* Habe, 1965 (type species from Japan); *A. yamomotoi* Habe, 1974 (also from Japan); *A. marshalli* Warén, 1981 (from New Zealand); *A. ptilocrinicola* (Bartsch, 1907) (from British Columbia); and *A. aurisflamma* Simone & Martins, 1995 (from Brazil). The latter is the only species described for the Atlantic Ocean, and of which the anatomy is known. The members of the genus *Annulobalcis* have been found to be ectoparasites of crinoids.

The genus *Batheulima* Nordsieck, 1968, has been described for *B. fuscoapicata* (Jeffreys, 1884) (Bouchet & Warén, 1986), from Portugal, and was reported for deep waters. The host of *Batheulima* species is still unknown.

The Marion-Dufresne material is deposited at the mollusk collection of the Musée National d'Histoire Naturelle of Paris, France (**MNHN**), while Revizee and PADCT material is deposited the Museu de Zoologia da Universidade de São Paulo, São Paulo, Brazil (**MZSP**). Except for some paratypes, that were distributed among these. Comparison with shell photo of Dall's type specimen was possible under courtesy of the National Museu of Natural History, Smithsonian Institution (**USNM**).

SYSTEMATICS

Annulobalcis procera, sp. nov.

Figs. 1-4

Type material. Holotype. MNHN, shell.
Paratypes. MZSP 34512 + 34513, 2 shells from type locality. BRAZIL: São Paulo: off São Sebastião Island, 23°47'S 42°10'W, 610 m depth, 3 shells (MD55, sta. CB105, Bouchet, Leal & Métivier col., 02/vi/1987).

Type locality. BRAZIL: Espírito Santo: off Conceição da Barra, 19°36'S 38°53'W, 640 m depth (MD55, sta. CB93, Bouchet, Leal & Métivier col., v/1987).

Diagnosis. SE Brazilian deepwater species. Shell long, slender, translucent, white. Aperture long, almost half of spire length.

Description. Shell up to 15 mm, turriform, slender, narrow, pointed (apical angle about 27°), up to 12 weakly convex whorls. Color translucent white, semi-transparent. Protoconch with 2.5 whorls; first whorl flat, remainder whorls narrow, almost of same size. Transition between protoconch and teleoconch

marked by distinct sigmoid, shallow, axial furrow. Spire very long, slender. Suture shallow, but distinct. Shell surface almost smooth, glossy; marked by several extremely thin, somewhat uniform spiral striae; subsutural striae slightly deeper. Axial, shallow furrows sparsely present, apparently randomly distributed. Aperture long, narrow; length almost half of spire length. Inner lip weakly concave; callus somewhat broad, more conspicuous anteriorly, preceding inferior area. Outer lip with sharp edge, middle region slightly projected, and convex. Inferior region somewhat wide, with lip deflected, projected forwards. Columella simple. Umbilicus absent.
Measurements (in mm). Holotype: 14.6 by 4.6; Paratypes (from type locality): MZSP 34512) 13.4 by 4.4; MZSP 34513) 5.8 by 2.4; (from sta. CB105): 7.7 by 2.7.

Distribution. S. E. Brazilian coast, from Espírito Santo to São Paulo.

Habitat. The depth ranges from 610 to 640 m. No information about the host is available.

Etymology. The specific name refers to the elongated aspect of the shell, from Latin *procera*, meaning slender, tall.

***Batheulima lutescens*, sp. nov.**
Figs. 5-8

Type material. Holotype. MNHN, shell.
Paratypes. BRAZIL, (MD55, Bouchet, Leal & Métivier col.). Espírito Santo; off São Mateus, 18°59'S 37°50'W, 637 m depth, 1 shell (sta. CB76). São Paulo; off São Sebastião Island, 23°47'S 42°10'W, 610 m depth, MZSP 34514 + 34515, 2 shells, MNHN, 2 shells (sta. CB105, 02/vi/1987).

Type locality. BRAZIL; Espírito Santo; off Conceição da Barra, 19°36'S 38°53'W, 640 m depth, (MD55 sta. CB93, Bouchet, Leal & Métivier col., v/1987).

Diagnosis. SE Brazilian deepwater species. Shell suture shallow. Color translucent white, with yellow spiral band in middle region of each whorl. Aperture almost half of spire length.

Description. Shell up to 10 mm, turriform, slender, narrow, pointed (apical angle about 22°), up to 14 weakly convex whorls. Color translucent white, with a broad spiral band, yellow, running along middle region of each whorl. Protoconch with 2 whorls, first whorl mamillated, pale brown, remainder whorls narrow, increasing weakly. Transition between protoconch and teleoconch marked by distinct sigmoid, shallow, axial furrow. Spire very long, slender. Suture very shallow, distinctively to weakly marked. Surface almost smooth, glossy; delicately marked by growth lines. Last whorl weakly to distinctively angulated. Aperture long, narrow; length almost half of spire length. Inner lip slightly concave; callus very narrow. Outer lip with sharp edge, middle region slightly projected and convex. Inferior region somewhat wide, with lip deflected, projected anteriorly. Columella simple. Umbilicus absent.
Measurements (in mm). Holotype: 10.0 by 3.2; MNHN (#1) (from type locality): 8.6 by 2.7; MZSP 34514: 10.7 by 3.2; MZSP 34515: 6.8 by 1.9; MNHN (from sta. CB55): 7.8 by 2.5.

Distribution. S. E. Brazilian coast, from Espírito Santo to São Paulo.

Habitat. The depth ranges from 610 to 640 m. No information about the host is available.

Etymology. The specific name refers to the yellowish color of the shell band, from the Latin *lutescens*, meaning yellowish.

***Batheulima epixantha*, sp. nov.**
Figs. 9-12

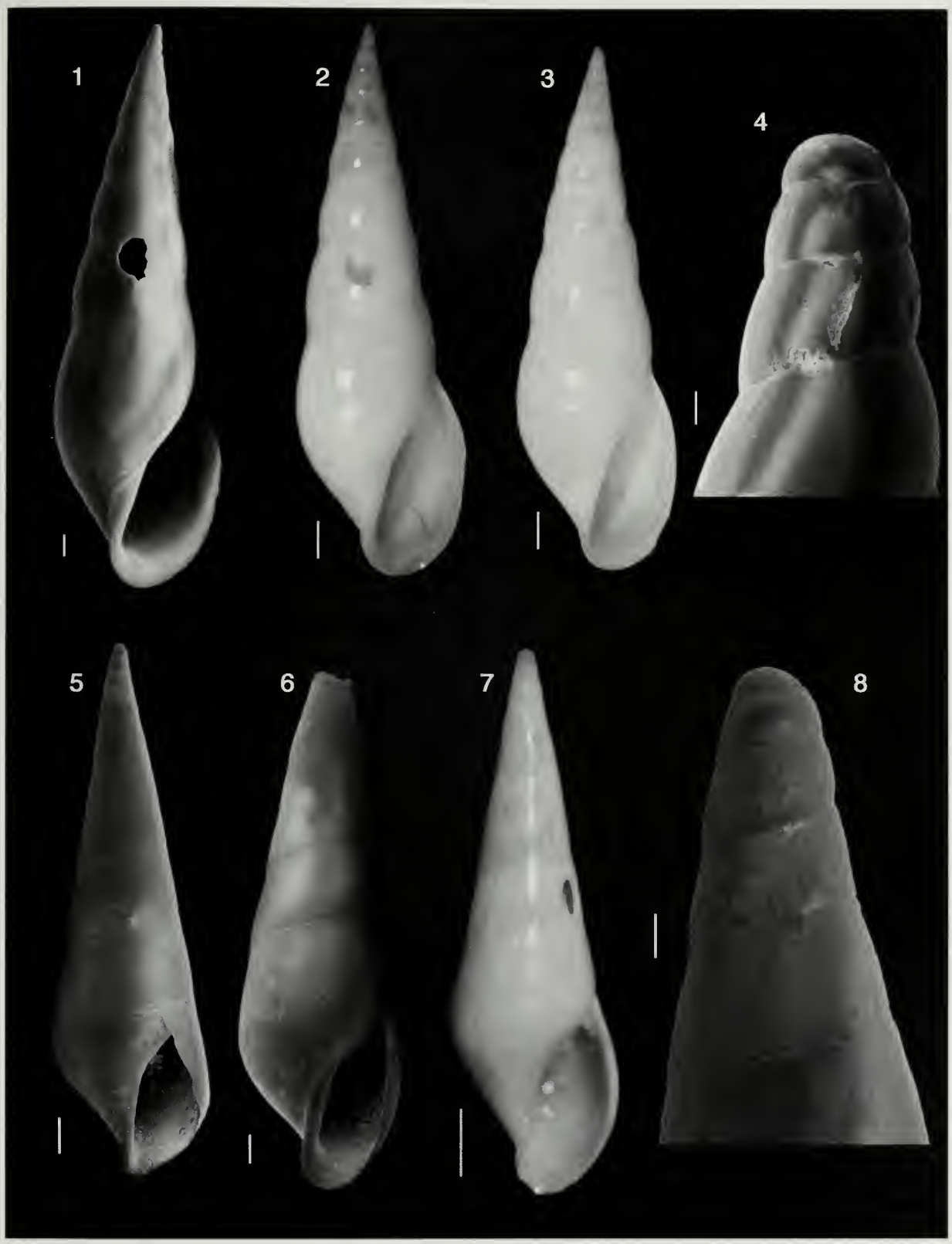
Type material. Holotype. MZSP 34518, shell.
Paratypes. MZSP 34519 + 34520, 2 shells, MNHN, 1 shell (#3), from type locality. BRAZIL; São Paulo, off Ilha de Santo Amaro, 24°17.939'S 44°35.983'W, 133 m depth, MZSP 34516, 1 shell (Sta. 6673, 11/i/1998); off Santos, 24°40.747'S 44°50.822'W, 137 m depth, MZSP 34517, 1 shell (sta. 6677, 12/i/1998).

Type locality. BRAZIL; **Santa Catarina**; off Itajai, 27°10.380'S 47°27.540'W, 129 m depth (sta. 6635, 09/xii/1997).

Diagnosis. S. E. Brazilian deepwater species with shell suture shallow. Color semi-transparent, whitish, with a narrow yellow spiral band in supra-sutural region of each whorl. Aperture almost 1/3 of spire length.

Figures 1-8

1-4. *Annulobalcis procera*. **1**. Holotype, SEM, scale = 0.5 mm **2**. Same, optical photo, scale = 1 mm **3**. Paratype 1 (MZSP 34512), scale= 1 mm **4**. Detail of holotype protoconch, SEM, scale= 50 µm. Figs. **5-8**. *Batheulima lutescens* **5**. Paratype 1, SEM (MNHN, Sta. 105), scale= 0.5 mm **6**. Paratype 2, SEM (same data), scale=0.5 mm **7**. Holotype (MNHN, Sta. 93), scale= 1 mm **8**. Protoconch of paratype 1, SEM, scale = 0.1 mm.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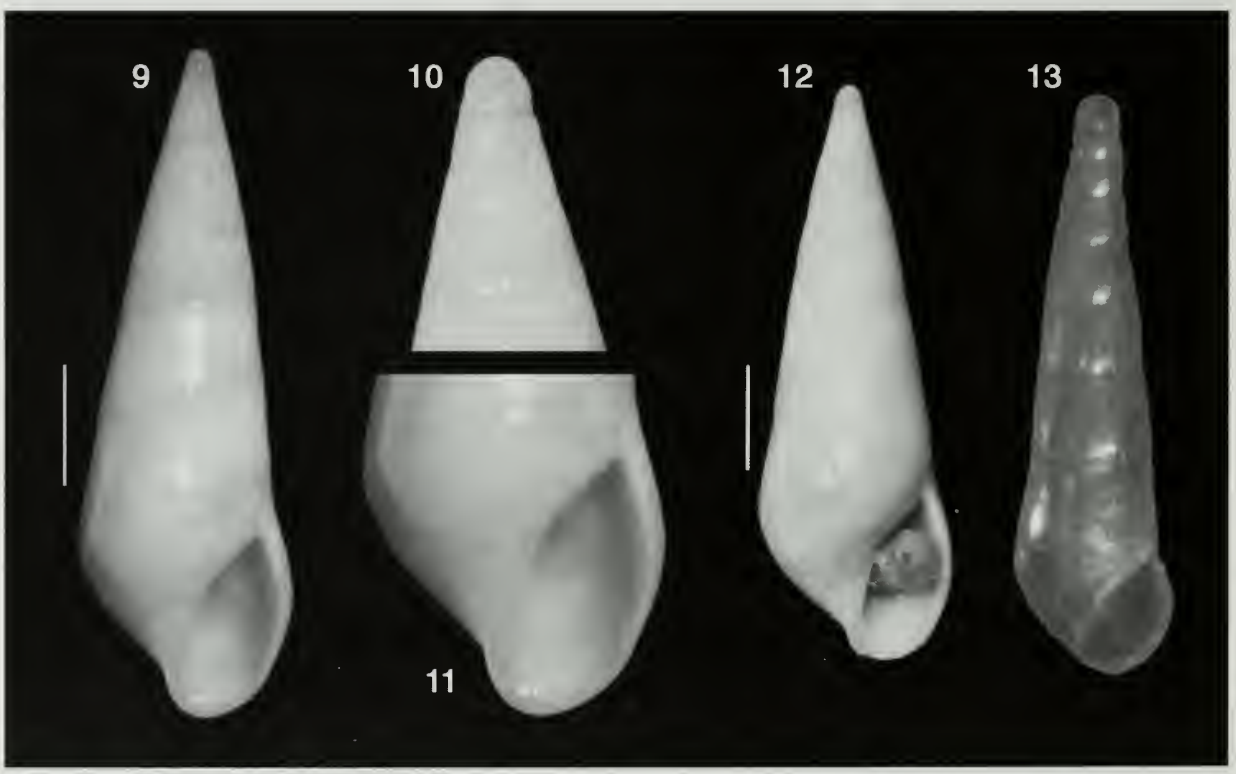
Description. Shell up to 7 mm, turriform, slender, narrow, pointed (apical angle about 26°), up to 11 weakly convex whorls. Color translucent white, with narrow yellow spiral band, running along supra-sutural region of each whorl. Protoconch with 2 whorls, first whorl mamillated, pale brown, remainder whorls narrow, increasing weakly. Transition between protoconch and teleoconch marked by distinct sigmoid, shallow, axial furrow. Spire very long, slender. Suture very shallow, distinctively to weakly marked. Surface almost smooth, glossy; marked only by delicate growth lines. Last whorl weakly to distinctively angulated. Aperture moderately long, length almost 1/3 of spire length. Inner lip slightly concave; callus somewhat broad. Outer lip with sharp edge, middle region slightly projected and convex. Inferior region rounded, with lip not deflected. Columella simple. Umbilicus absent.

Measurements (in mm). Holotype: 5.7 by 1.7; Paratypes (from type locality): MZSP 34519: 6.6 by 1.8; MZSP 34520: 3.5 by 1.2; MNHN (from type locality): 3.6 by 1.2.

Distribution. S. E. Brazilian coast, from São Paulo to Santa Catarina.

Habitat. The depth ranges from 129 to 137 m. No information about the host is available.

Etymology. The specific name refers to the yellowish color of the shell band, from the Greek *epixantha*, meaning part yellow.



Figures 9-13

9-12. *Batheulima epixantha*. **9-11**. Holotype **9**. Frontal view **10**. Detail of apex **11**. Detail of the aperture **12**. Paratype (MZSP 34519). Scales = 1 mm **13**. *Strombiformis elata* Dall, 1927, type USNM 108381, courtesy USNM, length 8 mm.

DISCUSSION

The three species described here differ from any Brazilian species of eulimid (Rios, 1994), except *Annulobalcis aurisflamma*, in having well marked suture. Most eulimids from this region have the suture in a straight profile.

Annulobalcis procera shell differs from remainder congeners in being longer and narrower. Additionally, it differs from *A. aurisflamma* in being less transparent (maybe an artifact in being dead collected), in having a shorter aperture (almost half of spire length, while *A. aurisflamma* has the aperture length only slightly shorter than the spire), and more spiral striae. The depth where they occur are also very different, as *A. procera* was collected at a depth of more than 600 m, while *A. aurisflamma* occurs from the intertidal zone to 8 m depth.

Batheulima lutescens and *B. epixantha* were assigned to this genus due to their similarity with the type species, the Northern Atlantic *B. fuscoapicata*, in characters such as the shell and aperture shape, impressed suture, and the darker protoconch. They differ from the type species in having a longer aperture (from almost half to 1/3 of spire length, while *B. fuscoapicata* has aperture length with about 1/4 of the spire), and by the color. *B. epixantha* differs from *B. lutescens* by being smaller (around 6 mm, while *B. lutescens* reaches more than 10 mm), the color pattern (the yellow spiral band is narrower and situated in the supra-sutural region of each whorl, while *B. lutescens* has the band broader, situated in the middle region of each whorl). Also, the aperture of *B. epixantha* is shorter (about 1/3 of spire length, while *B. lutescens* the aperture is about half of spire length), has thicker lip, the inner lip has a broader callus, and the anterior (siphonal) region is simpler and blunter (while this region of *B. lutescens* is clearly projected forwards). The outline looks different, *B. epixantha* is broader, with spire angle of about 26°, while *B. lutescens* is sharper pointed, with spiral angle of about 22°. The depth of occurrence appears to be also different, as *B. epixantha* occurs at about 130 m and *B. lutescens* about 600 m deep.

B. lutescens resembles *Strombiformis patula* (Dall & Simpson, 1901), differ in having less projected outer lip, shorter aperture and pointed apex<. *B. lutescens* also resembles *Strombiformis fusus* (Dall, 1889), differs in having broader aperture, wider spire and broader protoconch. The three species described here differ from those eulimids described by Dall (1927) and Watson (1886), mostly by well marked suture. The single which can be confused is *Strombiformis elata* Dall (Fig. 13), from which the species here described differ in having the aperture proportionally longer, broader outline, apex more pointed, and in being larger.

ACKNOWLEDGMENTS

The material collected by the Marion-Dufresne expedition was sent for this study as courtesy of Dr. Philippe Bouchet and Philippe Maestrati, at the MNHN. The Revizee material was sent for study by Dr. Cintia Miyaji, IOUSP (Instituto Oceanográfico da Universidade de São Paulo) and Dr. Antonia Cecília Amaral, UNICAMP (Universidade de Campinas), who send the material of the south regional sub-committee. The photo of the *Strombiformis elata* type was courtesy of Tyjuana Nickens and Dr. M.G. Harasewych, from USNM. The Revizee project is supported by "Ministério do Meio Ambiente, dos Recursos Hídricos e da Amazônia Legal" (MMA), "Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis" (IBAMA), "Comissão Interministerial para os Recursos do Mar" (CIRM) and "Programa de Apoio ao Desenvolvimento Científico e Tecnológico" (CNPq). The PADCT material was responsibility of Dr. Cintia Miyaji and Dr. Airton Tararam, IOUSP. For Paulino José S. Souza Jr. for reviewing the manuscript. For Lara M. Guimarães for helping the SEM studies. This project is carried on by the CNPq, and is performed by the IOUSP. This study is part of a project developed under a support of Fapesp, Fundação de Amparo a Pesquisa do Estado de São Paulo (procs. # 00/11074-5 and #00/11357-7).

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